



User Manual

SOM-AB5510

ADVANTECH

Enabling an Intelligent Planet

Copyright

The documentation and the software included with this product are copyrighted 2014 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties, which may result from its use.

Acknowledgements

Intel and Pentium are trademarks of Intel Corporation.

Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Technical Support and Assistance

1. Visit the Advantech website at <http://support.advantech.com> where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! Warnings indicate conditions, which if not observed, can cause personal injury!



Caution! Cautions are included to help you avoid damaging hardware or losing data. e.g.



There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! Notes provide optional additional information.



Document Feedback

To assist us in making improvements to this manual, we welcome comments and constructive criticism. Please send all such - in writing to:

support@advantech.com

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any items are missing, please contact your dealer immediately.

SOM-AB5510 Module

- 1x SOM-AB5510 (3.5" Application Board for COM-Express Mini module)
- 1x1700008894 (SATA Cable 7P 30CM)
- 1x1700018785 (SATA Power Cable 15P/1*4P-2.5 35CM)
- 1x1703100152 (Audio Cable 2*5P-2.0/JACK*3 20cm)

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
16. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Contents

Chapter 1 General Information1

1.1	Introduction	2
1.2	Connectors and Jumper Settings	3
1.2.1	Connector Location	3
	Figure 1.1 Connector Location - Front side	3
	Figure 1.2 Connector Location - Back side	3
1.2.2	I/O Connector Location	4
	Figure 1.3 I/O Location-side	4
	Figure 1.4 I/O Location-back	4
1.2.3	Button, Jumper and Switch location	5
	Figure 1.5 Button, Jumper and Switch location - Front side	5
	Figure 1.6 Button, Jumper and Switch location - Back side	5
1.2.4	LED Location	6
	Figure 1.7 LED Location	6
1.2.5	Connector List	6
	Table 1.1: Connector List	6
1.2.6	Jumper and Switch List	7
	Table 1.2: Jumper and Switch List	7
1.2.7	Jumper Settings	7
	Table 1.3: (JUMP1) Selection Straps for LVDS Backlight Voltage	7
	Table 1.4: (JUMP2) Selection Straps for BIOS IC Boot Source ..	7
	Table 1.5: (JRTC1) Clear COMS Jumper	7
	Table 1.6: (PJUMP1) Selection Straps for AT/ATX Mode	8
	Table 1.7: (SW6) Selection Straps for Mini PCIe/mSATA Auto-de- tection	8
1.2.8	Connector Pin Definition	8
	Table 1.8: (JPS1) ATX 4 Pin 12 V in Connector	8
	Table 1.9: (JPS2) Adapter 8.5V~20V in Connector	8
	Table 1.10: (JBAT1) Battery Connector	9
	Table 1.11: (JRTC2) Coin Battery Connector	9
	Table 1.12: (JPB1) Power Button Connector	9
	Table 1.13: (JGPIO1) GPIO Pin Header	10
	Table 1.14: (JSMB1) SMBus Connector	10
	Table 1.15: (JI2C1) I2C Connector	10
	Table 1.16: (JLPC1) LPC Connector	11
	Table 1.17: (JACK1) Line-in, Line-out and MIC Connector	11
	Table 1.18: (JFAN1) FAN Connector	11
	Table 1.19: (JFP1) Front Panel Pin Header	12
	Table 1.20: (JLVDS1) LVDS Interface Connector	13
	Table 1.21: (JLVDS2) LVDS Invertor Power Connector	14
	Table 1.22: (JSATA2) SATA 5V Power Connector	14
1.2.9	LED Instructions List	14
	Table 1.23: LED Instructions List	14
	Table 1.24: (LED7) DC IN Power Present / Absent	15
	Table 1.25: (LED8) 5V Standby Power Present / Absent	15
	Table 1.26: (LED3) Sleep S3 Present / Absent	15
	Table 1.27: (LED5) Sleep S4 Present / Absent	15
	Table 1.28: (LED4) Sleep S5 Present / Absent	15
	Table 1.29: (LED1) SATA data transfer Active / Inactive	15

Chapter 1

General Information

1.1 Introduction

SOM-AB5510 is an application board for COM-Express Mini Type 10 pin-out module with 3.5" form factor, which fully complies with the PCI Industrial Computer Manufacturers PICMG COM Express standard.

SOM-AB5510 has several popular features and rich I/O expansions, such as mSATA, USB3.0, USB Client, CAN Bus, Mini PCIe and more. In addition, SOM-AB5510 also supports wide voltage input (8.5~20V) and is compliant with Smart Battery Charger Specification V1.1 (SBS V1.1). All these features are designed to meet wide-ranged application of embedded products.

Advantech also provides design reference for several features. Please contact your distributor, sales representative, or Advantech's customer service center for technical support.

1.2 Connectors and Jumper Settings

1.2.1 Connector Location

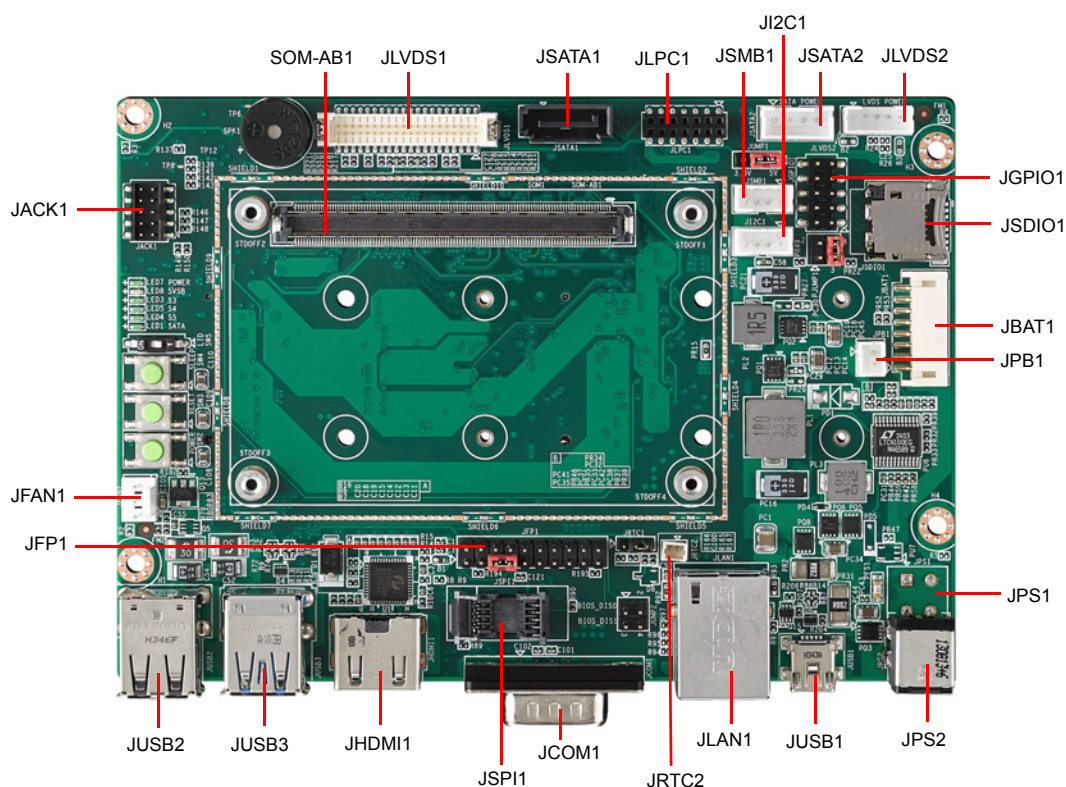


Figure 1.1 Connector Location - Front side

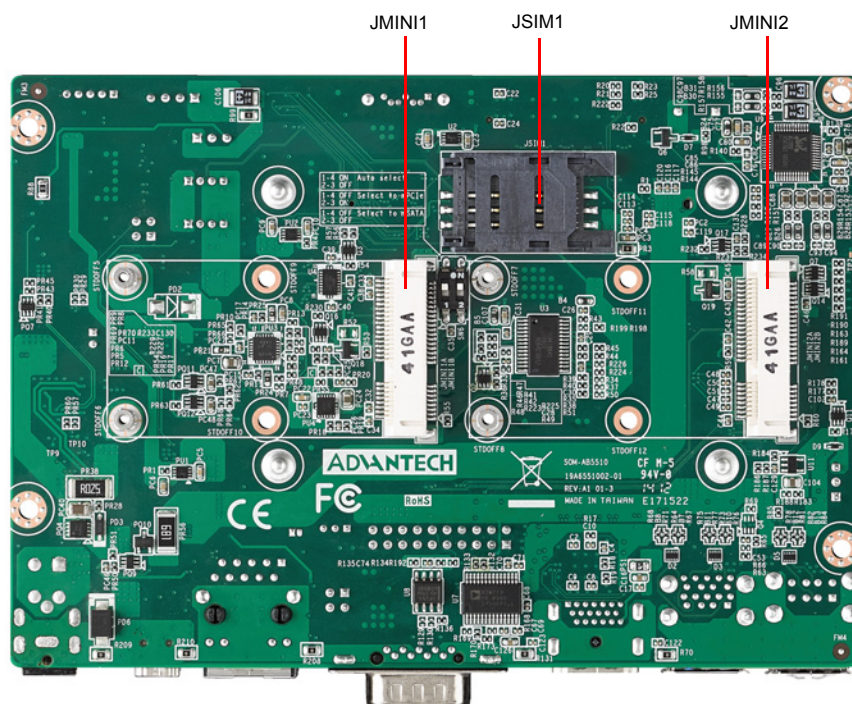


Figure 1.2 Connector Location - Back side

1.2.2 I/O Connector Location

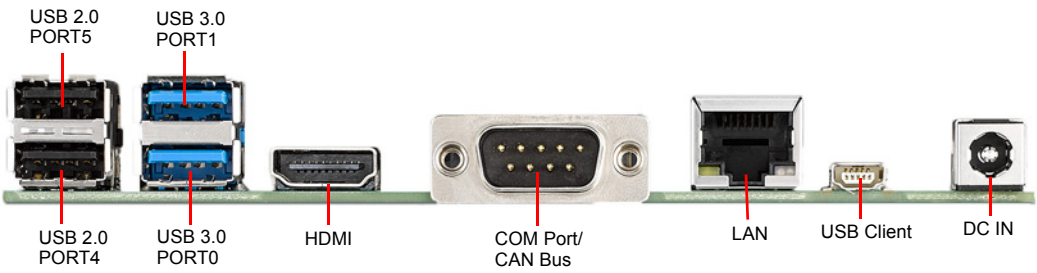


Figure 1.3 I/O Location-side

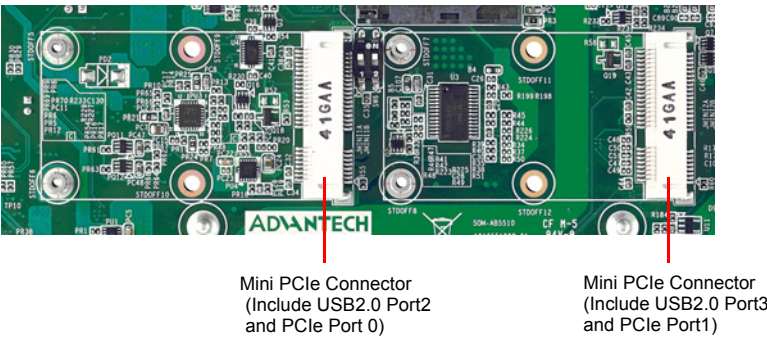


Figure 1.4 I/O Location-back

1.2.3 Button, Jumper and Switch location

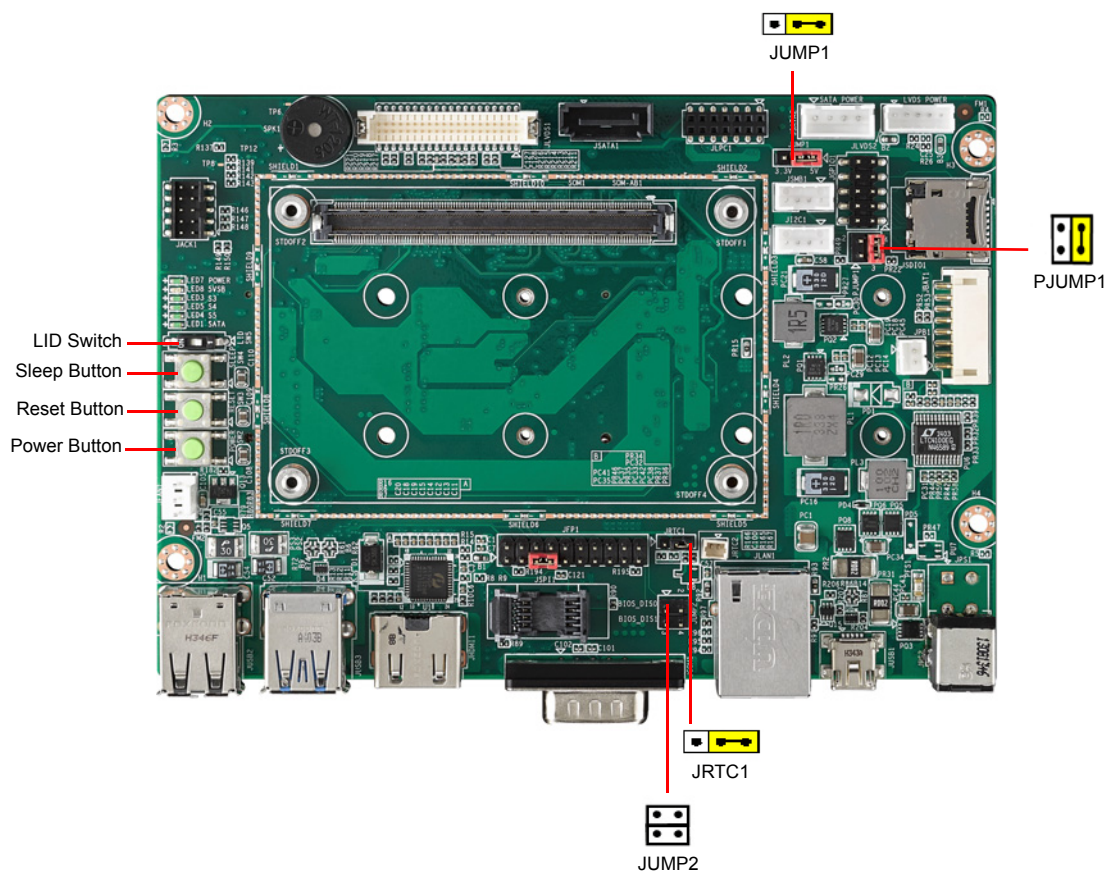


Figure 1.5 Button, Jumper and Switch location - Front side

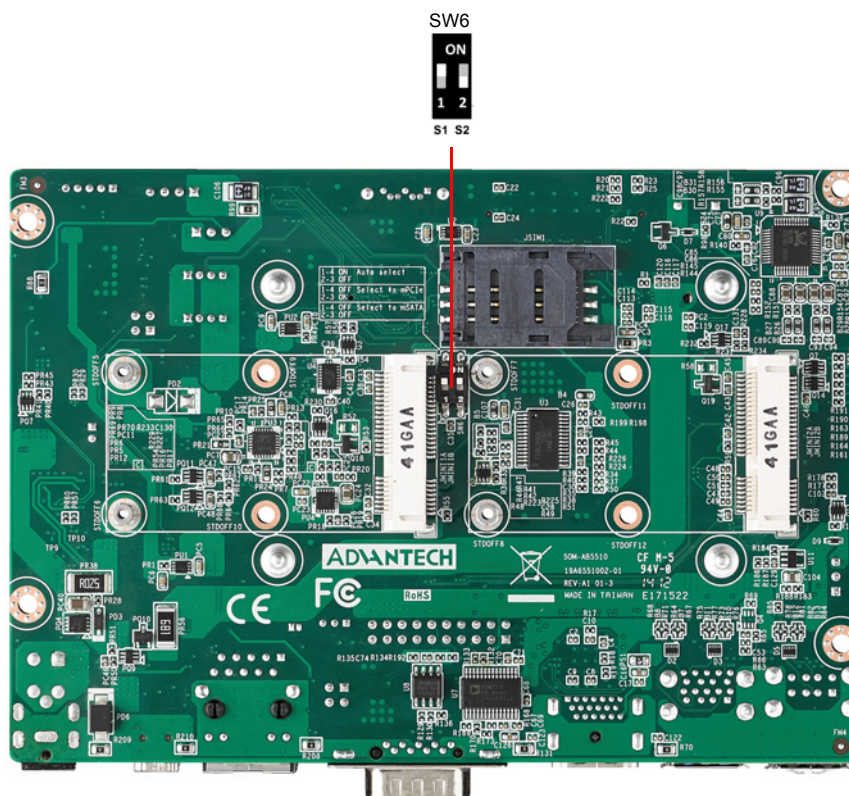


Figure 1.6 Button, Jumper and Switch location - Back side

1.2.4 LED Location

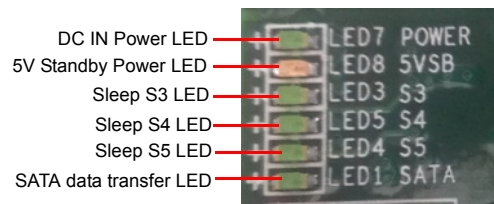


Figure 1.7 LED Location

1.2.5 Connector List

Table 1.1: Connector List

Label	Function
JPS1	ATX 4 Pin 12 V in Connector
JPS2	Adapter 8.5V~20V in connector
SOM-AB1	COM Connector
JUSB1	USB Client Connector
JUSB2	USB2.0 Port 4 & 5
JUSB3	USB3.0 Port 0 & 1
JMINI1	Mini PCIe PORT 0 Connector (Include USB2.0 Port 2)
JMINI2	Mini PCIe PORT 1 Connector (Include USB2.0 Port 3)
JSIM1	SIM Card Socket
JHDMI1	HDMI Connector
JLVDS1	LVDS Interface Connector
JLVDS2	LVDS Invertor Power Connector
JSATA1	SATA Connector
JSATA2	SATA 5V Power Connector
JSDIO1	SDIO Connector
JLPC1	LPC Connector
J SMB1	SMBus Connector
JI2C1	I2C Connector
JGPIO1	GPIO Pin Header
JPB1	Power Button Connector
JBAT1	Battery Connector
JRTC2	Coin Battery Connector
JSPI1	SPI EEPROM Socket
JFP1	Front Panel Pin Header
JCOM1	COM Connector
JACK1	Line-in, Line-out and MIC Connector
JFAN1	FAN Connector
JLAN1	LAN Connector

1.2.6 Jumper and Switch List

Table 1.2: Jumper and Switch List

Label	Function
JUMP1	Selection straps for LVDS Backlight Voltage
JUMP2	Selection straps for BIOS IC boot source
JRTC1	Clear COMS Jumper
PJUMP1	Selection straps for AT/ATX Mode
SW6	Selection straps for Mini PCIe/mSATA auto-detection

1.2.7 Jumper Settings

Table 1.3: (JUMP1) Selection Straps for LVDS Backlight Voltage

Pin	Function
1-2	5V (Default)
2-3	3.3V




Table 1.4: (JUMP2) Selection Straps for BIOS IC Boot Source

J1	J2	SPI Descriptor	Bios Entry
No Jumper	No Jumper	COM SPI	COM SPI (Default)
1-2	No Jumper	COM SPI	Carrier FWH
No Jumper	3-4	Carrier SPI	COM/Carrier SPI
1-2	3-4	COM SPI	COM/Carrier SPI

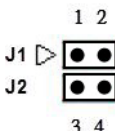


Table 1.5: (JRTC1) Clear COMS Jumper

Pin	Function
1-2	Clear CMOS
2-3	Normal Operation (Default)




Table 1.6: (PJUMP1) Selection Straps for AT/ATX Mode

J3	J4	Power Mode
1-2	No Jumper	AT POWER MODE
No Jumper	3-4	ATX POWER MODE (Default)

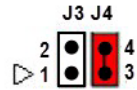


Table 1.7: (SW6) Selection Straps for Mini PCIe/mSATA Auto-detection

S1	S2	Function
ON	OFF	Auto-Detection (Default)
OFF	ON	Mini PCIe
OFF	OFF	mSATA
ON	ON	Mini PCIe



1.2.8 Connector Pin Definition

Table 1.8: (JPS1) ATX 4 Pin 12 V in Connector

Pin	Signal
1, 2	GND
3, 4	+VDC

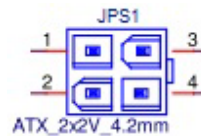


Table 1.9: (JPS2) Adapter 8.5V~20V in Connector

Pin	Signal
1	+VDC
2	GND

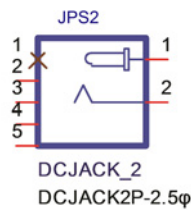
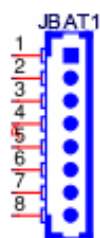
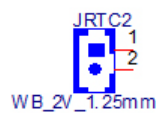


Table 1.10: (JBAT1) Battery Connector

Pin	Signal
1, 2	+VDC
3	ID
4	SMB_CLK
5	SMB_DATA
6	THERMAL
7, 8	GND

**Table 1.11: (JRTC2) Coin Battery Connector**

Pin	Signal
1	+VRTC
2	GND

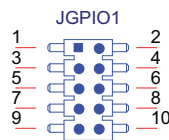
**Table 1.12: (JPB1) Power Button Connector**

Pin	Signal
1	PWRBTN#
2	GND



Table 1.13: (JGPIO1) GPIO Pin Header

Pin	Signal	Pin	Signal
1	GPI0	6	GPO2*
2	GPO0	7	GPI3
3	GPI1	8	GPO3
4	GPO1	9	GND
5	GPI2	10	GND

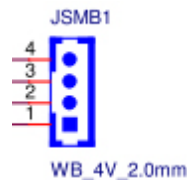


PH_5x2V_S2.54mm

*GPO2 is used by charger alert in default. Optional to release GPO2 if removing charger alert.

Table 1.14: (JSMB1) SMBus Connector

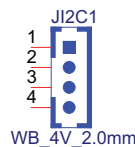
Pin	Signal
1	GND
2	SMB DATA
3	SMB CLOCK
4	+3.3V



WB_4V_2.0mm

Table 1.15: (JI2C1) I2C Connector

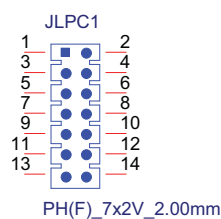
Pin	Signal
1	GND
2	I2C DATA
3	I2C CLOCK
4	+3.3V



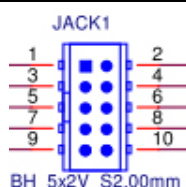
WB_4V_2.0mm

Table 1.16: (JLPC1) LPC Connector

Pin	Signal	Pin	Signal
1	Clock	8	GND
2	LPC AD1	9	LPC AD2
3	PLTRST#	10	SMB Clock
4	LPC AD0	11	SERIRQ
5	LPC FRAME#	12	SMB DATA
6	+3.3V	13	+5V
7	LPC AD3	14	+5V

**Table 1.17: (JACK1) Line-in, Line-out and MIC Connector**

Pin	Signal	Pin	Signal
1	Right Line out	6	Left Line in
2	Right Line in	7	GND
3	GND	8	GND
4	GND	9	Right MIC in
5	Left Line out	10	Left MIC in

**Table 1.18: (JFAN1) FAN Connector**

Pin	Signal
1	GND
2	+V_FAN
3	FANTACH

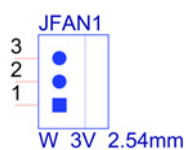


Table 1.19: (JFP1) Front Panel Pin Header

Pin	Signal	Pin	Signal
1	NA	11	SATA LED
2	NA	12	Pull Up to +3.3V via 220 ohm
3	PWR LED	13	POWER BUTTON#
4	GND	14	GND
5	SPKR	15	NA
6	GND	16	NA
7	BUZZER	17	RESET BUTTON#
8	NA	18	GND
9	NA	19	Watch Dog LED
10	NA	20	GND

Function Description

PIN	Function	Description
3-4	Power LED Connector (Pin 3 is positive)	For Power status LED
5-6	Buzzer Connector	For external buzzer
5-7	Buzzer Jumper (Default)	Enable on-board buzzer
11-12	SATA LED Connector (Pin 12 is positive)	For SATA data transfer LED
13-14	Power Button Connector	For power button
17-18	Reset Button Connector	For system reset button
19-20	Watch Dog LED Connector (Pin 19 is positive)	For watch dog timeout indication LED

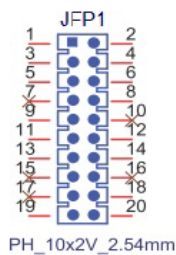


Table 1.20: (JLVDS1) LVDS Interface Connector

Pin	Signal	Pin	Signal
1	+LCDVDD	21	LVDS_D2+
2	+LCDVDD	22	NA
3	GND	23	GND
4	GND	24	GND
5	+LCDVDD	25	LVDS_CLK-
6	+LCDVDD	26	NA
7	LVDS_D0-	27	LVDS_CLK+
8	NA	28	NA
9	LVDS_D0+	29	GND
10	NA	30	GND
11	GND	31	LVDS_DDC_CLK
12	GND	32	LVDS_DDC_DATA
13	LVDS_D1-	33	GND
14	NA	34	EDP_HDP
15	LVDS_D1+	35	LVDS_D3-
16	NA	36	NA
17	GND	37	LVDS_D3+
18	GND	38	NA
19	LVDS_D2-	39	Pull Down to ground via 4.7K ohm
20	NA	40	LVDS_CTRL

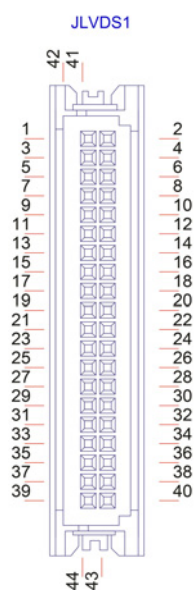
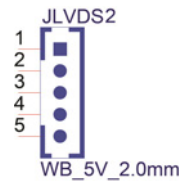
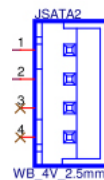


Table 1.21: (JLVDS2) LVDS Invertor Power Connector

Pin	Signal
1	+5V
2	GND
3	LVDS Back Light Enable
4	Back Light Control
5	+5V

**Table 1.22: (JSATA2) SATA 5V Power Connector**

Pin	Signal
1	+5V
2	GND
3	NA
4	NA



1.2.9 LED Instructions List

Table 1.23: LED Instructions List

LED	Indication
LED7	DC IN Power Present / Absent
LED8	5V Standby Power Present / Absent
LED3	Sleep S3 Present / Absent
LED5	Sleep S4 Present / Absent
LED4	Sleep S5 Present / Absent
LED1	SATA data transfer Active / Inactive

Table 1.24: (LED7) DC IN Power Present / Absent

LED Signal	Light	Dark
Description	DC IN Power Present	DC IN Power Absent

Table 1.25: (LED8) 5V Standby Power Present / Absent

LED Signal	Light	Dark
Description	5V Standby Power Present	5V Standby Power Absent

Table 1.26: (LED3) Sleep S3 Present / Absent

LED Signal	Light	Dark
Description	Sleep S3 Present	Sleep S3 Absent

Table 1.27: (LED5) Sleep S4 Present / Absent

LED Signal	Light	Dark
Description	Sleep S4 Present	Sleep S4 Absent

Table 1.28: (LED4) Sleep S5 Present / Absent

LED Signal	Light	Dark
Description	Sleep S5 Present	Sleep S5 Absent

Table 1.29: (LED1) SATA data transfer Active / Inactive

LED Signal	Glisten	Dark
Description	SATA data transfer Active	SATA data transfer Inactive



Enabling an Intelligent Planet

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2014